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NEXRAD Product Improvement
Open Radar Data Acquisition (ORDA)
Technical Manual Plan (TMP)
OSTPLN-ORDA-009

NWS Office of Science and Technology

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1 Introduction

The purpose of this Technical Manual Plan (TMP) is to maintain the integrity of the WSR-88D technical manuals. ROC Program Branch is responsible for maintaining the WSR-88D's technical manuals. This TMP describes how the ORDA project team will develop (manage, and integrate) ORDA technical manuals for the WSR-88D.

1.1 Technical Manual Mission

Technical manuals are to be the official information source for operations, maintenance, and modifications.

1.2 Technical Manual Goals

Disseminate accurate technical information, instructions, and safety procedures.

1.3 Technical Manual Users

(1) Operators, (2) Maintenance, (3) Retrofit/Modification Teams, (4) Training, (5) Depot, and (6) Engineering

2 Reference Documents

TM-86-01	NEXRAD Technical Manual Contract Requirements, 30 July 2002
ROCPLN-PGM-04	Technical Data Management Plan
MIL-STD-38784	Standard Practice For Manuals, Technical: General Style And Format Requirements

3 Organization

3.1 ROC Program Branch Chief

The ROC Program Branch Chief has the final approval for releasing all technical manuals for Government Printing Office printing and deployment distribution.

3.2 OST

Until Program Management Responsibility Transfer (PMRT), OST will have technical manual acquisition oversight responsibility. The OST-COTR Engineer will oversee technical information and accuracy of new technical manuals and changes to existing technical manuals.

3.3 RSIS

RSIS will lead development and writing of (1) new technical manuals, and (2) will identify and assist with making ORDA-specific changes (i.e., change chapters) to existing technical manuals.

For changes to existing technical manuals, the RSIS will attach the following items to PCRs: (1.) ORDA-specific text (MS Word format), (2.) redlined chapters (with bookmarks for changes), and (3.) redlined figures to submitted PCRs.

RSIS will submit TCTOs attachments to TCTOs.

RSIS will schedule and host (1) Technical Guidance Conference, (2) 30% Review that will be broken up into two reviews (half of the affected technical manuals will be reviewed at CDR, and the remainder will be reviewed at Component Test Readiness Review), (3) 60% Review (all affected technical manuals will be reviewed at Integration Test Readiness Review), (4) 90% Review (a.k.a. Technical Manual Verification – all affected technical manuals will be reviewed at System Test Readiness Review), and (5) Prepublication Review.

Until the warranty expiration date agreed upon by the Government and RSIS, RSIS will warranty work (i.e., have ORDA-specific technical manual maintenance responsibility) by performing updates and corrections to (1) new technical manuals, and (2) submitted changes.

RSIS will adhere to established ROC procedures and processes. The documentation hierarchy is:

(1) TM 86-01 (NEXRAD Technical Manual Contract Requirements, 30 July 2000)
(2) Minutes of discussions with ROC System Documentation Section
(3) ROCPLN-PGM-04 (Technical Data Management Plan)
(4) MIL-STD-38784 (Standard Practice For Manuals, Technical)

3.4 ROC Engineering & NWS Hotline

The NWS Hotline is an end-user of the technical manuals. They will assist RSIS with critiquing the technical manuals by performing a walk-through of the procedures during the System Test Phase.

3.5 NWS Training

The NWS Training (Kansas City) is an end-user of the technical manuals. They will use the technical manuals to develop their training material.

3.6 ROC Program Documentation Team (PDT)

The ROC Program Documentation Team (PDT) maintains all technical manuals. ROC PDT will process, track, and implement changes enacted by a Publication Change Request (PCR).

ROC PDT will verify compliance to Time-Compliance-Technical-Orders (TCTOs).

ROC PDT will provide guidelines, recommendations, and instructions to RSIS concerning technical manual fitness-for-use.

The ROC PDT will incorporate changes provided by RSIS into existing technical manuals.

The ROC PDT will submit “Final” technical manuals to the Government Printing Office (GPO) for printing.

At predetermined times, ROC PDT will coordinate “Final” technical manual distribution to RADAR sites.

ROC PDT will take over (1) technical manual acquisition oversight responsibility, and (2) technical manual change and correction writer responsibility.

DEFINITION: “Final” technical manuals are fully completed manuals that have been verified for accuracy and are ready for printing by GPO.

3.7 ROC Configuration Management Team (CMT)

The ROC Program Configuration Management Team (CMT) (1.) maintains all engineering drawings, and (2.) creates or edits technical manual figures. ROC CMT will incorporate changes provided by RSIS for existing technical manuals (the delivery vehicle is the submitted PCR).

4 Technical Manual Milestones

The three phases for the ORDA Project are (1) Prototype Phase, (2) Production Phase, and (3) Deployment Phase.

Figure 1 is the general timeline or schedule of events.

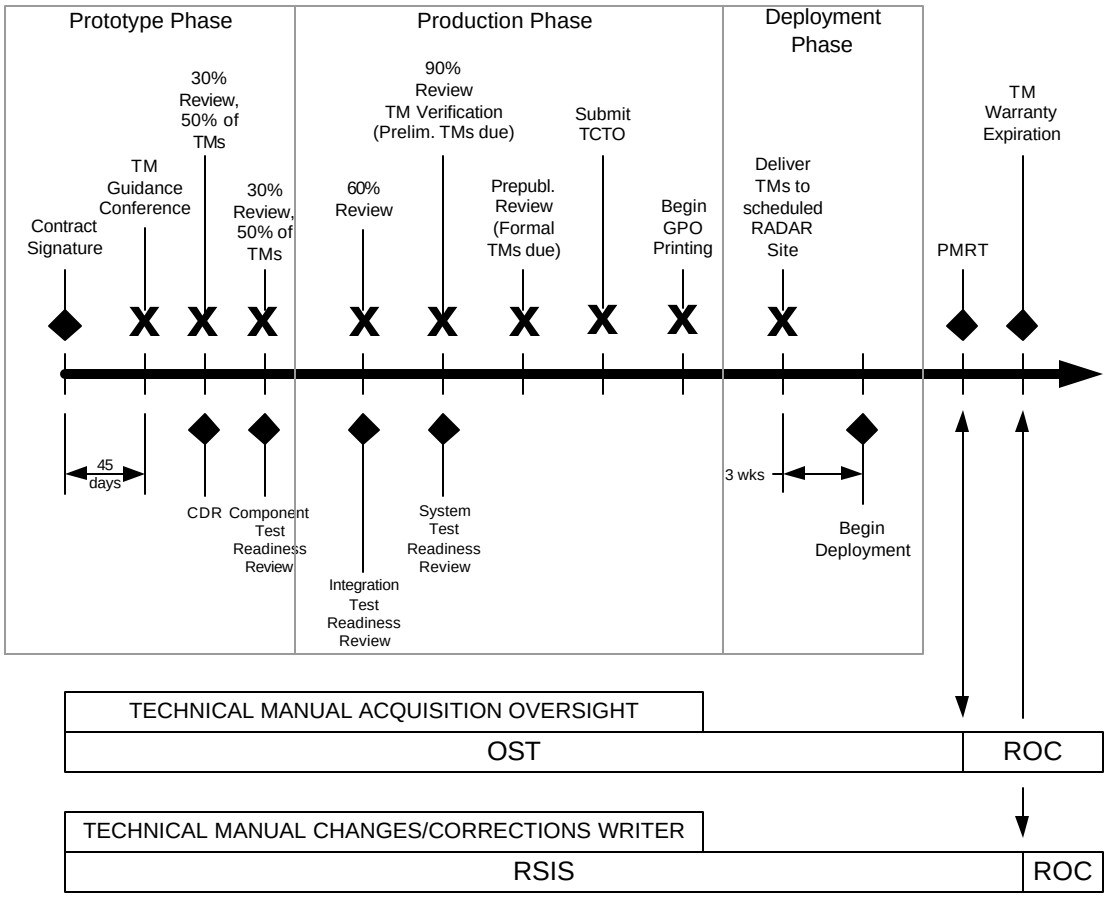

Figure 1. General schedule of events timeline.

At PMRT, technical manual acquisition oversight (i.e., the responsibility for overseeing technical manual information accuracy, content, and technical manual distribution) transfers from OST to ROC.

At some point in time to be negotiated between the Government and RSIS (reference the System Transition Plan), technical manual maintenance responsibilities will transfer from RSIS to ROC.

4.1 Prototype Phase

Within the Prototype Phases are the following design reviews: (1) Preliminary Design Review, (2) Critical Design Review, and (3) Component Test Readiness Review.

Deliverable	Due Date
Technical Manual Guidance Conference: Review ORDA Technical Manual Plan (TMP)	45 days after Contract signature
30% Draft Review of half the TMs	Critical Design Review
30% Draft Review of remaining TMs	Component Test Readiness Review

30% Draft Reviews will involve RSIS, ROC Engineering, ROC EMS, ROC Hotline, ROC PDT, NWSTC, FAA, and DOD.

4.2 Production Phase

Within the Production Phase are the following design reviews: (1) Integration Test Readiness Review, (2) System Test Readiness Review, (3) Production Readiness Review, (4) Acceptance Test Readiness Review, and (5) Deployment Readiness Review.

Deliverable	Due Date
60% Draft Review of all TMs	Integration Test Readiness Review
90% Draft Review of all Preliminary TMs	System Test Readiness Review
(1) Prepublication Review, and (2) submit TCTOs	Acceptance Test Readiness Review

60% Draft Review will involve RSIS, ROC Engineering, ROC EMS, ROC Hotline, ROC PDT, NWSTC, FAA, and DOD.

4.3 Deployment Phase

Deliverable	Due Date
Deliver Formal TMs to RADAR sites	3 weeks before scheduled installation

5 Technical Manual Matrix

The technical manual matrix is a planning and organizing tool that (1.) lists existing and new technical manuals, (2.) assigns general deadlines, and (3.) illustrates the degree of difficulty.

5.1 Technical Manual Matrix Explanation

The left-hand column lists the technical manuals that are potentially affected by the ORDA project and new technical manuals (EHB 515 series). This list may be updated as the ORDA project matures.

The top column lists the general activities that are required to develop the technical manuals.

The cells within the matrix are (1) color-coded, and (2) contain the general deadline in the form of an abbreviation of the phase review.

5.1.1 Color-Code Explanation

Blue denotes an easy implementation (defined as low implementation difficulty). This means the resources needed to perform the activity won't have to overcome extraordinary hurdles nor devote excess time.

Yellow denotes a "typical" implementation (defined as nom, or nominal, implementation difficulty). This means the resources needed to perform the activity will be as (innately) expected and not out of the ordinary.

Red denotes a difficult implementation (defined as hi implementation difficulty). This means the resources needed to perform the activity will have to overcome difficult hurdles or devote excess time.

5.1.2 Deadline Explanation

CDR – Critical Design Review (occurs at the end of the Critical Design Phase)
CTRR – Component Test Readiness Review (occurs before Component Testing starts)
ITRR – Integration Test Readiness Review (occurs before Integration Testing starts)
STRR – System Test Readiness Review (occurs before System Testing starts)
ATRR – Acceptance Test Readiness Review (occurs before Acceptance Testing starts)

5.1.3 Activity Explanation

Theory of Operation – writing down how the system, configuration item (CI), line replaceable unit (LRU), computer program configuration item (CPCI), or operating system (OS) receives inputs and feedback, processes this information, the resultant outputs, and how it delivers the outputs.

ID Obsolete Sections – reviewing the legacy technical manuals and subsequently determining what sections need to be removed or replaced.

ID and Change Obsolete References – this activity removes or changes the literature and software commands that were identified during the "ID Obsolete Sections" activity.

Operator & Maintenance Commands – this activity adds new operator and maintenance commands.

Signal & Power Block Diagrams – drawing block diagrams for signal and power. General means drawings depict large granularity (for example, connecting CIs). Detailed means drawings depict fine granularity (for example, signals within a CI).

Alignment & Calibration Procedures – writing alignment & calibration procedures for new CIs, and (as required) rewriting legacy alignment & calibration procedures.

Diagram Renumbering – renumbering particular legacy drawings and incorporating new drawings and diagrams.

Hotline/Technician Review – Hotline and El-Techs critique the technical manuals while they are still in the developmental stage.

Interleaf, Framemaker, or Other Import – importing technical manual material into ROC's Interleaf, Framemaker, or some other ROC specified format.

Maintenance Illustrations (general/detailed) – drawing illustrations for operator and maintenance visual aids or instructions.

Illustrated Parts Breakdown – blown up assembly drawing that depicts LRUs.

Fault/Troubleshooting, Remove/Replace – equipment fault and troubleshooting hints, equipment remove & replace instructions.

5.1.4 Technical Manual Matrix

Manual	Theory of Operation	ID Obsolete Sections	Signal & Power Block Diagrams (general)	Signal & Power Block Diagrams (detailed)	Operator & Maintenance Commands	ID & Change Obsolete References	Alignment & Calibration Procedures	Diagram Renumbering	Hotline/Technician Review	Interleaf, Framemaker, or Other Import	Maintenance Illustrations (general & detailed)	Illustration Parts Breakdown	Fault & Troubleshooting, Remove & Replace
6-500	CDR	CDR	CDR	N/A	ITRR	ITRR	N/A	ITRR	TBD	TBD	ATRR	N/A	N/A
6-501	N/A	CTRR	N/A	N/A	N/A	ITRR	N/A	ITRR	TBD	TBD	N/A	ATRR	N/A
6-502	N/A	CDR	N/A	N/A	ITRR	ITRR	ITRR	N/A	TBD	TBD	ATRR	N/A	N/A
6-503	N/A	CTRR	N/A	N/A	ITRR	ITRR	ITRR	N/A	TBD	TBD	ATRR	N/A	N/A
6-503-2	N/A	CTRR	N/A	N/A	ITRR	ITRR	ITRR	N/A	TBD	TBD	ATRR	N/A	N/A
6-511	CDR	CDR	CDR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
6-513	CDR	CDR	CDR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
6-514	CDR	CDR	CDR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
6-525	CTRR	CTRR	CTRR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
6-526	CTRR	CTRR	CTPR	N/A	ITRR	ITRR	N/A	N/A	TBD	TBD	N/A	N/A	N/A
6-530	CTRR	CTRR	CTPR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
6-540	CTRR	CTRR	CTRR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
6-545	CTRR	CTRR	CTRR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
6-550	CDR	CDR	CDR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
6-553	CDR	CDR	CDR	ITRR	ITRR	ITRR	ITRR	ITRR	TBD	TBD	ATRR	N/A	ATRR
WSR-88D Hdbk Vol III	CDR	CDR	CDR	N/A	ITRR	ITRR	N/A	ITRR	TBD	TBD	ATRR	N/A	N/A
6-515	CDR	CDR	CDR	ITRR	ITRR	ITRR	ITRR	ITRR	STRR	TBD	ATRR	ATRR	ATRR
6-515-1	CDR	CDR	N/A	N/A	ITRR	ITRR	N/A	ITRR	STRR	TBD	ATRR	ATRR	N/A
6-515-2	CDR	CDR	N/A	N/A	ITRR	ITRR	N/A	ITRR	STRR	TBD	ATRR	ATRR	N/A
COTS Man	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	STRR	N/A	N/A	N/A	ATRR
OS Man	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	STRR	N/A	N/A	N/A	ATRR
COTS SW Man	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TBD	N/A	N/A	N/A	ATRR

1.1.1.1.1 Legend – Degree of Implementation Difficulty

Low

Nom

6 Technical Manual Program

The technical manual program requires the following major tasks:

- Ensuring the submission of an approved PCR (form TM-27) to PECP-0126,
- Establishing assignments and peer review assignments for technical manual changes and new technical manual creation,
- ROC performing a "fitness-for-use" on COTS and new manuals submitted by RSIS,
- RSIS (1) identifying and assisting with making changes to existing technical manuals, and (2) generating new technical manuals,
- ROC incorporating changes – provided by RSIS via PCR attachments – into existing technical manuals affected by the ORDA project (following the process explained in ROCPLN-PGM-04, "WSR-88D Technical Manual Program"), and
- RSIS will host periodic reviews (starting at 1 month frequency, but this frequency may increase or decrease) with ROC PDT and ROC CMT in order to keep abreast of identified and upcoming changes to drawings, figures, artwork, and illustrations. Source of information will primarily be based upon PCRs, ECOs, and other sources. The goals of these reviews is to enable RSIS and ROC to (1.) ensure RSIS is working with up-to-date drawings and figures, and (2.) determine the best course of action for handling changes to be incorporated by ROC.

The Technical Manual Program is based upon TM-86-01, "NEXRAD Technical Manual Contract Requirements," and ROCPLN-PGM-04, "WSR-88D Technical Manual Program."

6.1 Deliverables

There are four charts that illustrate the technical manual program work task flow. The four charts describe the tasks for (1.) publishing new technical manuals, (2.) approving COTS technical manuals, and (3.) implementing changes to existing technical manuals.

6.1.1 Chart 1

Chart 1 describes how the ORDA technical manual will begin. Major deliverables from Chart 1 are:

- ORDA Technical Manual Plan,
- PCR schedule,
- Agreements, assignments, and milestones between ROC Program Branch Chief, ROC branches (PDT, engineering, et.al.), RSIS and
- 30% & 60% Draft Reviews of new technical manual and changes to existing technical manuals

6.1.2 Chart 2

Chart 2 further describes how new, non-COTS ORDA technical manuals will be completed. Major deliverables from Chart 2 are:

- 90% Draft Review to verify technical manuals and changes,
- Completing technical manuals and changes,
- Ordering and distributing technical manual print-outs

6.1.3 Chart 3

Chart 3 describes how COTS manuals will be completed. Major deliverables from Chart 3 are:

- Letter requesting fitness-for-use letter
- Approval or disapproval of COTS fitness-for-use, and
- Preparing, ordering, and distributing COTS manual print-outs

6.1.4 Chart 4

Chart 4 describes how existing technical manuals will be changed. Major deliverables from Chart 4 are:

- RSIS-supplied change text (in MS Word format), redlined chapters (with bookmarks for changes), and redlined figures attached to submitted PCRs
- PDR-prepared, -ordered, and –distributed change chapter print-outs

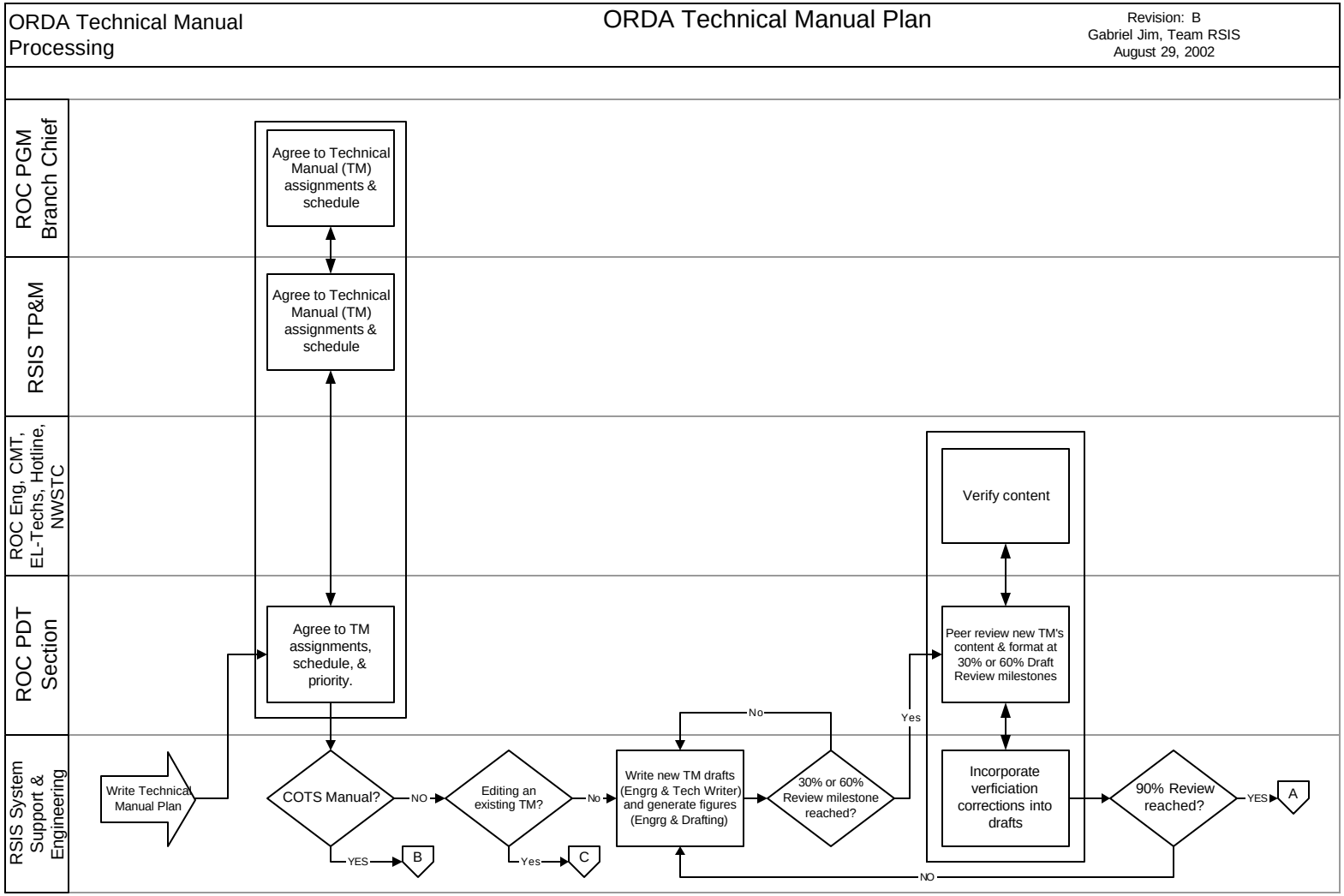

Chart 1. Starting the ORDA technical manual program.

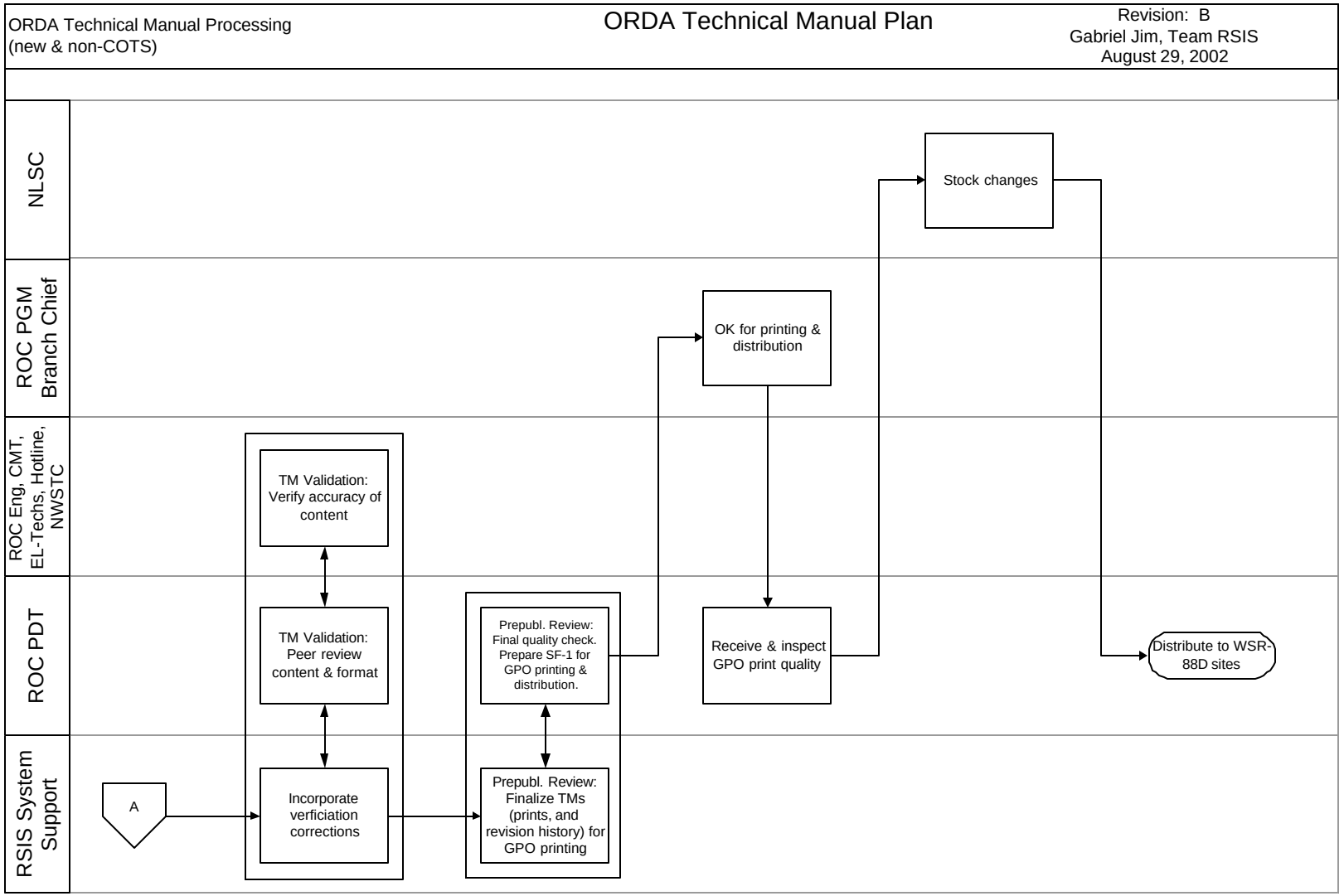

Chart 2. Completing new, non-COTS technical manuals.

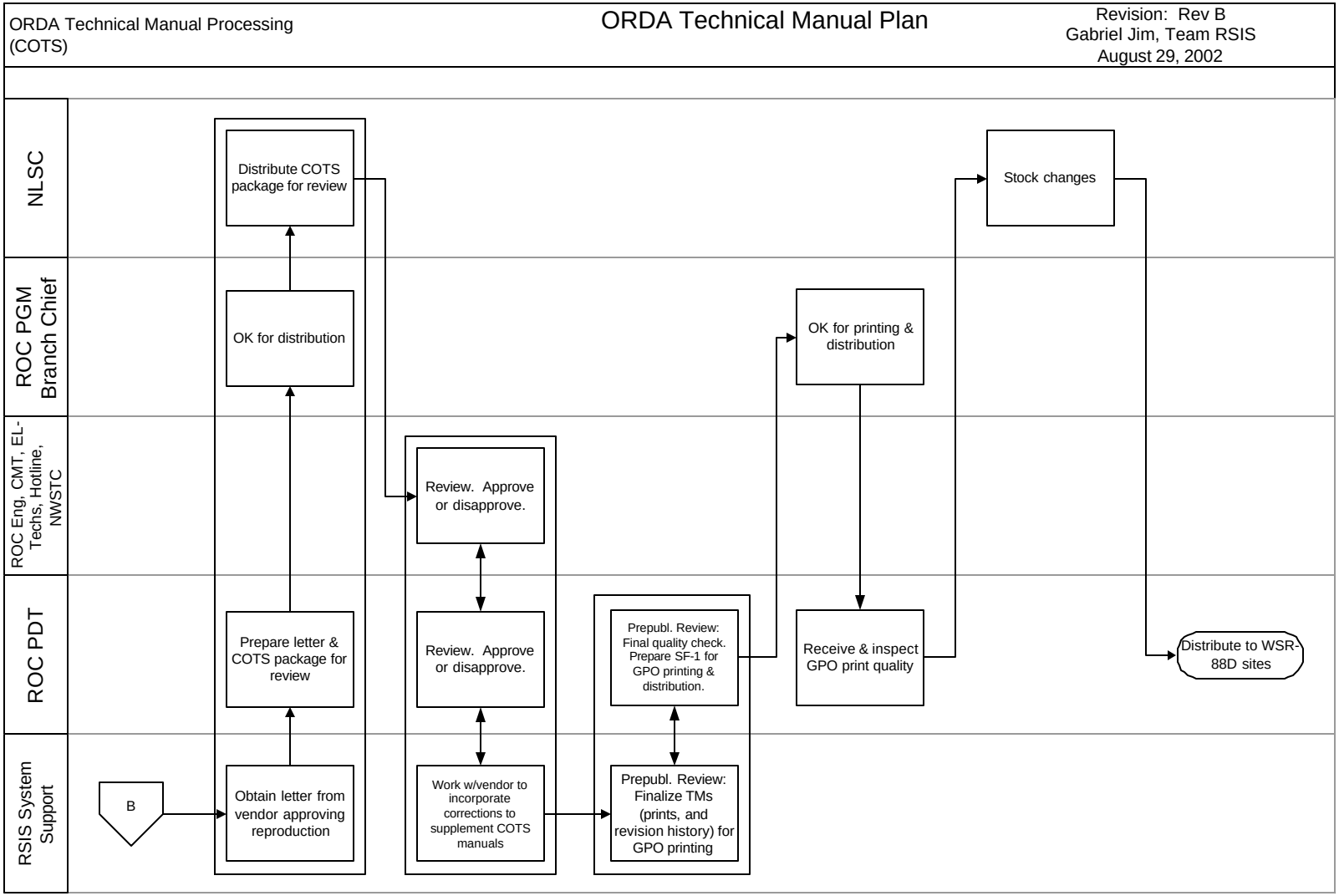

Chart 3. Completing COTS manuals.

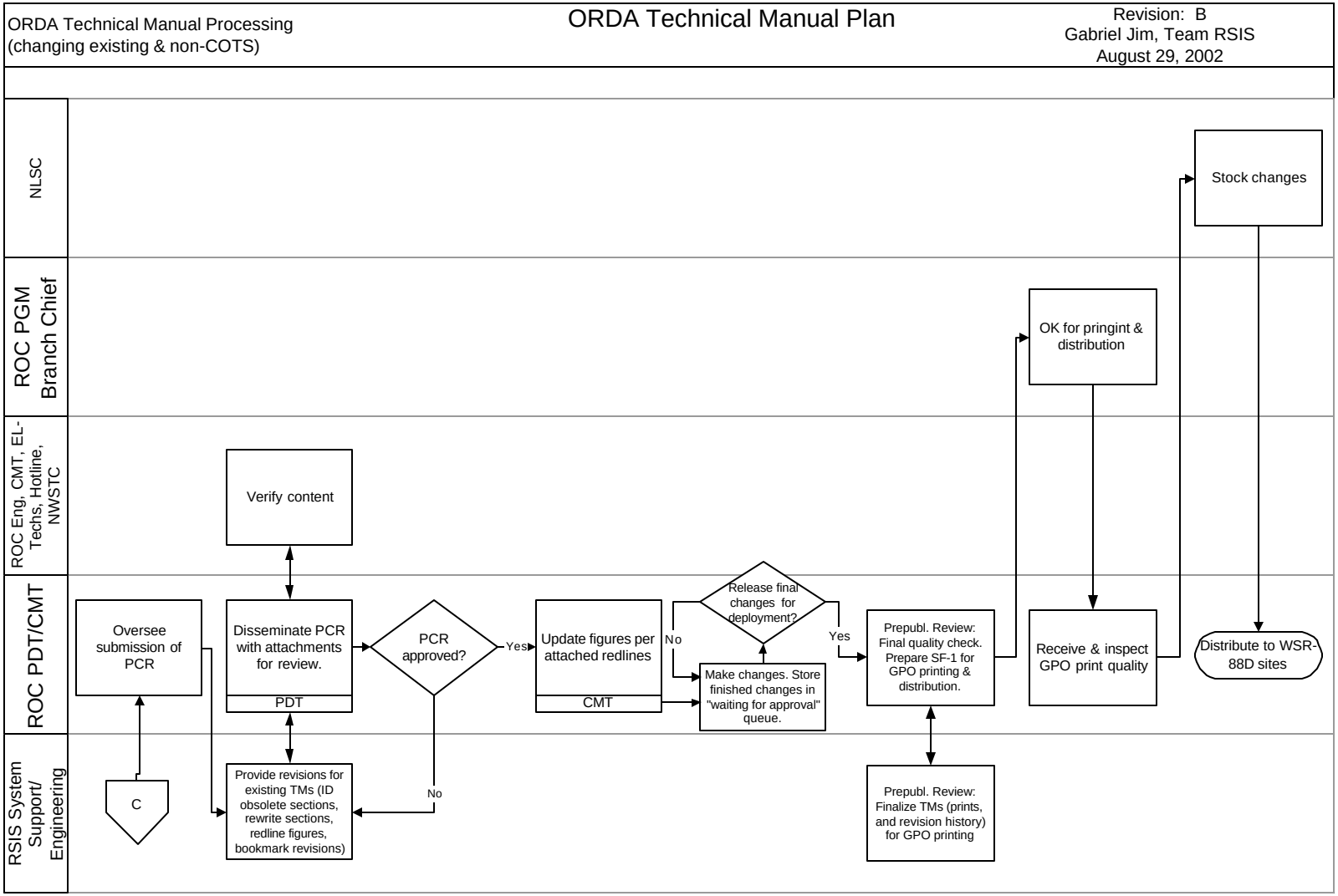

Chart 4. Changing existing technical manuals.

6.1.5 Technical Manual Program Activity Explanation

Agree to Technical Manual (T.M.) assignments & schedule – ROC and RSIS will negotiate assignments and schedules or milestones to make them advantageous to all concerned. ROC and RSIS will periodically review the technical program as manuals are added and the scope of the assignments change due to unforeseen or unpredictable events.

ROC's PCR process will be used to change existing technical manuals.

PCR Process Summary – ROC will either a.) submit, or b.) authorize RSIS to submit a PCR to ROC-PDT (Danny Green). ROC-PDT will update their MS Access database and subsequently attach a .PDF copy of the form. ROC-PDT will distribute the PCR and attachments (i.e., text & figures). The PCR's status will either be (1) pending, (2) complete, or (3) disapproved.

Write new T.M. drafts and generate figures – the actual process of writing a new technical manual. ROCPLN-PGM-04 describes the process in Appendix figures E.1, E.2, and E.3. The major points to call out are:

(1) RSIS-ROC Review of drafts at 30%, 60%, and 90% Draft Reviews,
(2) Verifications will primarily involve actual personnel and equipment when permissible. However, TOMA may approve a.) simulation, or b.) desk-top analysis to validate technical manuals for special circumstances where personnel or equipment safety is compromised.
(3) For RSIS's assigned deliverables, ROC PDT will provide peer review of content, style, and format; and ROC Engineering will verify content accuracy

Provide changes for existing TMs – RSIS's responsibilities for changing existing technical manuals. ROCPLN-PGM-04 describes the process in Appendix figures E.1, E.2, and E.3. The major points to call out are:

(1) Identify obsolete sections
(2) Redline existing technical manuals and bookmark areas for changes
(3) Redline figures and assist ROC CMT with creating new figures
(4) Prepare text changes in MS Word format

Update figures per attached redlines – ROC CMT will take redlines provided by RSIS (via PCR attachments) and either (1.) change existing technical manual figures, or (2.) create figures for existing technical manuals.

Generate changes from PCR attachments/CMT figures – ROC PDT will incorporate changes from PCR attachments and ROC CMT figures. Changes will be placed in a "waiting for approval" queue until ROC Program Branch Chief approves and releases it to the next step.

Prepublication Review – ROC PDT and RSIS will ensure the final product is ready for Government Printing Office (GPO). ROC Program Branch Chief will approve submissions to GPO and distribution to RADAR sites.

7 Technical Manual Format & Content

MIL-STD-38784 provides guidelines for technical manual outline format and information content. Further guidelines and instructions will be provided in minutes and discussions between ROC PDT and RSIS.

7.1 Data Format

For new manuals, format will be Quicksilver.

For changes to existing technical manuals, text format supplied to the Government will be MS Word.

TM Graphics:

a. AutoCad drawings will be saved in native .DWG format and converted to .DXF format for import into technical manual software.

b. Digital pictures will be saved in (1.) minimum 300 DPI .TIF for Grayscale, and (2.) minimum 300 DPI CMYK .TIF for Color.

c. Screen captures will be acquired using Snag It software and saved as minimum 300 DPI .TIF for both Grayscale and Color.

d. All other graphics will be saved in 300 DPI .TIF format.

For technical manuals, ROC supports Quicksilver and FrameMaker software. For drafting and figures, ROC supports Visio, ACAD, and CADRA software.

7.2 Data Storage

Technical manual storage <TBD>.

7.3 Reading Level

Reading level will be at the 9th grade.

7.4 Reproduction Permissions

The vendor(s) will supply a signed letter on their letterhead articulating reproduction permissions granted to the Government.

8 REVISION HISTORY

July 10, 2002	DOORS Baseline 0.0 = ORDA TMP REV A.doc
August 15, 2002	DOORS Baseline 0.1 = ORDA TMP REV A1.doc
August 29, 2002	Release ORDA Technical Manual Plan Revision B for September 2002 PDR